Claims:

1. A method for detecting errors in an image signal, in which the image signal is produced by dividing an image into image blocks, and
5 a coding stage is performed in which at least predictive coding is performed on an image block to produce inter-coded image information for the image block, said inter-coded image information comprising at least one prediction error block containing prediction error information, and a decoding stage is performed to recover prediction error
10 information contained in said at least one prediction error block, **wherein** a prediction error block check is performed in which prediction error information contained in said at least one prediction error block is examined to detect errors in the inter-coded image information for the image block.

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2. A method according to claim 1, **wherein** said prediction error block check comprises at least the following stages:

- a first calculation stage in which a first reference value is
20   produced on the basis of prediction error information contained in said at least one prediction error block, and

- a first comparison stage in which the first reference value calculated in the first calculation stage is compared to a first
25   value range, wherein if the first reference value falls outside said first value range, the inter-coded image information for the image block is considered to contain at least one error.

3. A method according to claim 2, **wherein** in the prediction error
30 block check a luminance prediction error block containing prediction error information relating to a luminance component of the image signal is used in the calculation of said first reference value.

4. A method according to claim 2, **wherein** in the prediction error
35 block check a chrominance prediction error block containing prediction error information relating to a chrominance component of the image signal is used in the calculation of said first reference value.

5. A method according to claim 1, wherein said inter-coded image information for the image block comprises a macroblock comprising at least one luminance prediction error block containing prediction error information relating to a luminance component of the image signal and

5   at least one chrominance prediction error block containing prediction error information relating to a chrominance component of the image signal, said image signal comprising at least one chrominance component.

10   6. A method according to claim 5, wherein in the prediction error block check said first calculation stage is performed for each of said at least one luminance prediction error block and for each of said at least one chrominance prediction error block of said macroblock to produce a first reference value for each of said at least one luminance prediction

15   error block and each of said at least one chrominance prediction error block of said macroblock and a corresponding first comparison stage is performed for each of said at least one luminance prediction error block and each of said at least one chrominance prediction error block of said macroblock, wherein if any of said first reference value for said at

20   least one luminance prediction error block or said at least one chrominance prediction error block of said macroblock falls outside said first value range, the inter-coded image information for the image block is considered to contain at least one error.

25   7. A method according to claim 6, wherein in the prediction error block check said first calculation stage and said first comparison stage are performed consecutively for each of said at least one luminance prediction error block and each of said at least one chrominance prediction error block of said macroblock, and each of said at least one

30   luminance prediction error block and said at least one chrominance prediction error block of said macroblock is examined in a sequence, such that the sequence is terminated if any of said first reference value for said at least one luminance prediction error block or said at least one chrominance prediction error block of said macroblock falls outside

35   said first value range and the inter-coded image information for the image block is considered to contain at least one error.

8. A method according to claim 6, wherein in the prediction error block check said first calculation stage and said first comparison stage are performed substantially immediately as each of said at least one luminance prediction error block or each of said at least one chrominance prediction error block of said macroblock is received.

9. A method according to claim 6, wherein in the prediction error block check said first calculation stage and said first comparison stage are performed for each of said at least one luminance prediction error block and each of said at least one chrominance prediction error block of said macroblock after all of said at least one luminance prediction error block and all of said at least one chrominance prediction error block of said macroblock have been received.

10. A method according to claim 6, wherein in the prediction error block check said first value range is assigned a first value when said comparison stage is performed on said at least one luminance prediction error block of said macroblock and a second value, different from said first value, when said first comparison stage is performed on said at least one chrominance prediction error block of said macroblock.

11. A method according to claim 6, wherein in the prediction error block check if said first reference value calculated for any of said at least one luminance prediction error block or any of said at least one chrominance prediction error block of said macroblock falls within said first value range, said first reference value is stored in a memory.

12. A method according to claim 5, wherein if no errors are detected in the prediction error block check, a macroblock check is performed in which a correspondence between prediction error information relating to the luminance component of the image signal and prediction error information relating to at least one of said at least one chrominance component of the image signal is examined to detect errors in the inter-coded image information for the image block.

13. A method according to claim 12, wherein said macroblock check comprises the following stages:

- a second comparison stage in which a second reference value calculated on the basis of said at least one chrominance prediction error block of said macroblock is compared with a second value range, wherein if the second reference value falls outside said second value range, a difference calculated on the basis of said at least one luminance prediction error block and said at least one chrominance prediction error block of the macroblock is compared with a third value range, wherein if the difference falls outside said third value range, the inter-coded image information for the image block is considered to contain at least one error.

14. A method according to claim 13, **wherein** said second reference value calculated on the basis of said at least one chrominance prediction error block of said macroblock is identical to a corresponding first reference value calculated for said at least one chrominance prediction error block of said macroblock during said prediction error block check, said corresponding first reference value having been stored in a memory in connection with said prediction error block check and retrieved from said memory during said macroblock check.

15. A method according to claim 13, **wherein** said second value range is smaller than said first value range.

16. A method according to claim 13, **wherein** if said difference calculated on the basis of said at least one luminance prediction error block and said at least one chrominance prediction error block falls within said third value range and said macroblock comprises at least one other chrominance prediction error block, said second comparison stage is repeated using said at least one other chrominance prediction error block of said macroblock.

17. A method according to claim 13, **wherein** if said second reference value falls within said second value range and said macroblock comprises at least one other chrominance prediction error block, said second comparison stage is repeated using said at least one other chrominance prediction error block of said macroblock.

18. A method according to claim 12, **wherein** the image block is reconstructed using said inter-coded image information for the image block after said macroblock check is performed.

19. A method according to claim 12, **wherein** the image block is reconstructed using said inter-coded image information for the image block before said macroblock check is performed.

20. A method according to claim 5, **wherein** the prediction error information contained in said at least one luminance prediction error block and said at least one chrominance prediction error block of said macroblock comprise pixel error values and said pixel error values of said at least one luminance prediction error block and said pixel error values of said a least one chrominance prediction error block are filtered to determine pixel error values of said at least one luminance prediction error block and said at least one chrominance prediction error block which are significant with respect to a threshold value and a third comparison stage is performed in which significant pixel error values comprised by said at least one chrominance prediction error block of said macroblock are compared with pixel error values at corresponding locations in said at least one luminance prediction error block, wherein if the number of locations for which a pixel error value in said at least one chrominance prediction error block is significant with respect to said threshold value and a pixel error value at a corresponding location in said at least one luminance prediction error block is not significant with respect to said threshold value exceeds a fourth value range (R4), the inter-coded image information for the image block is considered to contain at least one error.

21. A method according to claim 20, **wherein** the filtering is performed by thresholding the pixel error values of said at least one luminance prediction error block and said at least one chrominance prediction error block.

22. A method according to claim 20, **wherein** the filtering is performed by high-pass filtering the pixel error values of said at least one

luminance prediction error block and said at least one chrominance prediction error block.

23. A method according to claim 20, wherein a spatial resolution of said at least one luminance prediction error block of said macroblock is greater than a spatial resolution of said at least one chrominance prediction error block of said macroblock, wherein down-sampling of the pixel error values of said at least one luminance prediction error block is performed so as to reduce the spatial resolution of said at least one luminance prediction error block to correspond with the spatial resolution of said at least one chrominance prediction error block of said macroblock.

24. A method according to claim 20, wherein a spatial resolution of said at least one luminance prediction error block of said macroblock is greater than a spatial resolution of said at least one chrominance prediction error block of said macroblock, wherein up-sampling of pixel error values of said at least one chrominance prediction error block is performed so as to increase the spatial resolution of said at least one chrominance prediction error block to correspond with the spatial resolution of said at least one luminance prediction error block of said macroblock.

25. A method according to claim 1, wherein the prediction error information contained in said at least one prediction error block comprises pixel error values and a discrete cosine transform is applied to the pixel error values at the coding stage in order to form spatial frequency domain prediction error coefficients, wherein an inverse discrete cosine transform is applied to the spatial frequency domain prediction error coefficients prior to said prediction error block check.

26. A method according to claim 1, wherein variable length code words are used in the coding of said at least one prediction error block.

27. A method according to claim 1, wherein the image signal is produced from a video signal.

28. A method according to claim 1, wherein said inter-coded image information is transmitted from a first terminal to a second terminal, wherein at least said coding stage is performed prior to transmission of said inter-coded image information from said first terminal and said

5 decoding stage and prediction error block check are performed in said second terminal.

29. A method according to claim 12, wherein said inter-coded image information is transmitted from a first terminal to a second terminal,

10 wherein at least said coding stage is performed prior to transmission of said inter-coded image information from said first terminal and said decoding stage and macroblock check are performed in said second terminal.

15 30. A method for detecting errors in an image signal, in which the image signal is produced by dividing an image into image blocks, and a coding stage is performed in which at least predictive coding is performed on an image block to produce inter-coded image information for the image block, said inter-coded image information comprising a

20 macroblock comprising at least one luminance prediction error block containing prediction error information relating to a luminance component of the image signal and at least one chrominance prediction error block containing prediction error information relating to a chrominance component of the image signal, the image signal

25 comprising at least one chrominance component, and a decoding stage is performed to recover the prediction error information contained in said at least one luminance prediction error block and said at least one chrominance prediction error block of the macroblock, **wherein a** macroblock check is performed in which a correspondence between

30 prediction error information relating to the luminance component of the image signal and prediction error information relating to at least one of said at least one chrominance component of the image signal is examined to detect errors in the inter-coded image information for the image block.

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31. A terminal comprising means for receiving an image signal, the image signal having been formed by dividing an image into image blocks and performing a coding stage using at least predictive coding

on an image block to produce inter-coded image information for the image block said inter-coded image information comprising at least one prediction error block containing prediction error information, and decoding means for recovering prediction error information contained in said at least one prediction error block, **wherein** the terminal also comprises means for performing a prediction error block check in which prediction error information contained in said at least one prediction error block is examined to detect errors in the inter-coded image information for the image block.

32. A terminal according to claim 31, **wherein** said means for performing a prediction error block check comprise:

- means for producing a first reference value on the basis of prediction error information contained in said at least one prediction error block, and

- means for comparing the first reference value with a first value range,

- means for indicating that the inter-coded image information for the image block is considered to contain at least one error if the first reference value falls outside said first value range.

33. A terminal according to claim 31, **wherein** means for producing a first reference value comprise means for using a luminance prediction error block containing prediction error information relating to a luminance component of the image signal in the calculation of said first reference value.

34. A terminal according to claim 31, **wherein** means for producing a first reference value comprise means for using a chrominance prediction error block containing prediction error information relating to a chrominance component of the image signal in the calculation of said first reference value.

35. A terminal according to claim 31, **wherein** it comprises means for producing macroblocks comprising at least one luminance prediction

error block containing prediction error information relating to a luminance component of the image signal and at least one chrominance prediction error block containing prediction error information relating to a chrominance component of the image signal, said image signal comprising at least one chrominance component.

36. A terminal according to claim 35, **wherein** said means for performing a prediction error block check comprise:

- means for performing said first calculation stage for each of said at least one luminance prediction error block and for each of said at least one chrominance prediction error block of said macroblock to produce a first reference value for each of said at least one luminance prediction error block and each of said at least one chrominance prediction error block of said macroblock;

- means for performing said first comparison stage for each of said at least one luminance prediction error block and each of said at least one chrominance prediction error block of said macroblock; and

- means for indicating that the inter-coded image information for the image block is considered to contain at least one error if any of said first reference value for said at least one luminance prediction error block or said first reference value for said at least one chrominance prediction error block of said macroblock falls outside said first value range.

37. A terminal according to claim 36, **wherein** said means for performing a prediction error block check further comprise:

- means for performing said first calculation stage and said first comparison stage consecutively for each of said at least one luminance prediction error block and each of said at least one chrominance prediction error block of said macroblock in a sequence; and

- means for terminating the sequence if any of said first reference value for said at least one luminance prediction error block or said first reference value for said at least one chrominance prediction error block of said macroblock falls outside said first value range.

38. A terminal according to claim 36, **wherein** said means for performing a prediction error block check comprise means for performing said first calculation stage and said first comparison stage substantially immediately as each of said at least one luminance prediction error block or each of said at least one chrominance prediction error block of said macroblock is received.

39. A terminal according to claim 36, **wherein** said means for performing a prediction error block check comprise means for performing said first calculation stage and said first comparison stage for each of said at least one luminance prediction error block and each of said at least one chrominance prediction error block of said macroblock after all of said at least one luminance prediction error block and all of said at least one chrominance prediction error block of said macroblock have been received.

40. A terminal according to claim 36, **wherein** said means for performing a prediction error block check comprise means for assigning a first value to said first value range when said comparison stage is performed on said at least one luminance prediction error block of said macroblock and means for assigning a second value, different from said first value, to said first value range when said first comparison stage is performed on said at least one chrominance prediction error block of said macroblock.

41. A terminal according to claim 36, **wherein** said means for performing a prediction error block check comprise means for storing said first reference value in a memory of said terminal if said first reference value calculated for any of said at least one luminance prediction error block or any of said at least one chrominance prediction error block of said macroblock falls within said first value range.

42. A terminal according to claim 35, wherein it further comprises means for performing a macroblock check if no errors are detected by said means for performing a prediction error block check, said means
5 for performing a macroblock check comprising means for examining a correspondence between prediction error information relating to a luminance component of the image signal and prediction error information relating to at least one of said at least one chrominance component of the image signal to detect errors in the inter-coded
10 image information for the image block.

43. A terminal according to claim 42, wherein said means for performing a macroblock check further comprise:

15 - means for performing a second comparison stage in which a second reference value calculated on the basis of said at least one chrominance prediction error block of said macroblock is compared with a second value range;

20 - means for calculating a difference on the basis of said at least one luminance prediction error block and said at least one chrominance prediction error block of the macroblock if said second reference value falls outside said second value range;

25 - means for comparing said difference with a third value range; and

   - means for indicating that the inter-coded image information for the image block is considered to contain at least one error if
30 said difference falls outside said third value range.

44. A terminal according to claim 43, wherein said means for performing a macroblock check further comprise means for setting said second reference value equal to said first reference value calculated
35 for said at least one chrominance prediction error block of said macroblock by said means for performing a prediction error block check.

45. A terminal according to claim 43, **wherein** said means for performing a macroblock check further comprise:

- means for retrieving a first reference value stored in a memory of said terminal by said means for performing a prediction error block check; and

- means for setting said second reference value equal to said first reference value.

46. A terminal according to claim 43, **wherein** said means for performing a macroblock check further comprise means for repeating said second comparison stage if said difference calculated on the basis of said at least one luminance prediction error block and said at least one chrominance prediction error block falls within said third value range and said macroblock comprises at least one other chrominance prediction error block, said means for repeating said second comparison stage being arranged to repeat said second comparison stage using said at least one other chrominance prediction error block.

47. A terminal according to claim 43, **wherein** said means for performing a macroblock check further comprise means for repeating said second comparison stage if said second reference value falls within said second value range and said macroblock comprises at least one other chrominance prediction error block, said means for repeating said second comparison stage being arranged to repeat said second comparison stage using said at least one other chrominance prediction error block.

48. A terminal according to claim 35, **wherein** the prediction error information contained in said at least one luminance prediction error block and said at least one chrominance prediction error block of said macroblock comprise pixel error values and the terminal further comprises:
- means for filtering said pixel error values of said at least one luminance prediction error block and said at least one chrominance prediction error block of said macroblock to determine pixel error values of said at least one luminance

prediction error block and said at least one chrominance prediction error block which are significant with respect to a threshold value;

- means for performing a third comparison stage in which significant pixel error values comprised by said at least one chrominance prediction error block are compared with pixel error values at corresponding locations in said at least one luminance prediction error block; and

- means for indicating that the inter-coded image information for the image block is considered to contain at least one error if the number of locations for which a pixel error value in said at least one chrominance prediction error block is significant with respect to said threshold value and a pixel error value at a corresponding location in said at least one luminance prediction error block is not significant with respect to said threshold value exceeds a fourth value range.

49. A terminal according to claim 48, **wherein** said means for filtering said pixel error values comprise means for thresholding the pixel error values of said at least one luminance prediction error block and said at least one chrominance prediction error block of said macroblock.

50. A terminal according to claim 48, **wherein** said means for filtering said pixel error values comprise means for high-pass filtering the pixel error values of said at least one luminance prediction error block and said at least one chrominance prediction error block of said macroblock.

51. A terminal according to claim 48, **wherein** a spatial resolution of said at least one luminance prediction error block of said macroblock is greater than a spatial resolution of said at least one chrominance prediction error block of said macroblock, and that the terminal further comprises means for down-sampling the pixel error values of said at least one luminance prediction error block so as to reduce the spatial resolution of said at least one luminance prediction error block to correspond with the spatial resolution of said at least one chrominance prediction error block.

52. A terminal according to claim 48, **wherein** a spatial resolution of said at least one luminance prediction error block of said macroblock is greater than a spatial resolution of said at least one chrominance prediction error block of said macroblock, and that the terminal further

5   comprises means for up-sampling the pixel error values of said at least one chrominance prediction error block so as to increase the spatial resolution of said at least one chrominance prediction error block to correspond with the spatial resolution of said at least one luminance prediction error block.

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53. A terminal according to claim 31, **wherein** it is a wireless terminal.

54. A terminal comprising means for receiving an image signal, the image signal having been formed by dividing an image into image

15 blocks, and performing a coding stage using at least predictive coding on an image block to produce inter-coded image information for the image block, said inter-coded image information comprising a macroblock comprising at least one luminance prediction error block containing prediction error information relating to a luminance

20 component of the image signal and at least one chrominance prediction error block containing prediction error information relating to a chrominance component of the image signal, the image signal comprising at least one chrominance component, and decoding means for recovering prediction error information contained in said at least one

25 luminance prediction error block and said at least one chrominance prediction error block of the macroblock, **wherein** the terminal also comprises means for performing a macroblock check comprising means for examining a correspondence between prediction error information relating to a luminance component of the image signal and

30 prediction error information relating to at least one of said at least one chrominance component of the image signal to detect errors in the inter-coded image information for the image block.

55. A data transmission system comprising means for producing an

35 image signal from an image, means for dividing an image into image blocks and coding means for performing at least predictive coding on an image block to produce inter-coded image information for the image block said inter-coded image information comprising at least one

prediction error block containing prediction error information, and decoding means for determining the prediction error information contained in said at least one prediction error block, **wherein** the data transmission system also comprises means for performing a prediction

5   error block check in which prediction error information contained in said at least one prediction error block is examined to detect errors in the inter-coded image information for the image block.

56. A data transmission system according to claim 55, **wherein** it

10   further comprises means for performing a macroblock check if no errors are detected by said means for performing a prediction error block check, said means for performing a macroblock check comprising means for examining a correspondence between prediction error information relating to a luminance component of the image signal

15   and prediction error information relating to at least one of said at least one chrominance component of the image signal to detect errors in the inter-coded image information for the image block.

57. A data transmission system according to claim 55, **wherein** said

20   means for producing an image signal comprise means for producing an image signal from a video signal.

58. A data transmission system according to claim 55, **wherein** it comprises means for transmitting said inter-coded image information

25   from a first terminal to a second terminal, wherein the first terminal comprises said coding means and said second terminal comprises said decoding means, and said means for performing a prediction error block check.

30   59. A data transmission system according to claim 56, **wherein** it comprises means for transmitting said inter-coded image information from a first terminal to a second terminal, wherein the first terminal comprises said coding means and said second terminal comprises said decoding means, and said means for performing a macroblock check.

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60. A data transmission system comprising means for producing an image signal from an image, means for dividing an image into image blocks, and coding means for performing at least predictive coding on

an image block to produce inter-coded image information for the image block, said inter-coded image information comprising a macroblock comprising at least one luminance prediction error block containing prediction error information relating to a luminance component of the

5 image signal and at least one chrominance prediction error block containing prediction error information relating to a chrominance component of the image signal, the image signal comprising at least one chrominance component, and decoding means for recovering the prediction error information contained in said at least one luminance

10 prediction error block and said at least one chrominance prediction error block of the macroblock, **wherein** the data transmission system also comprises means for performing a macroblock check comprising means for examining a correspondence between prediction error information relating to a luminance component of the image signal and

15 prediction error information relating to at least one of said at least one chrominance component of the image signal to detect errors in the inter-coded image information for the image block.

61. A decoder for decoding an image signal, the image signal having

20 been formed by dividing an image into blocks and performing a coding stage using at least predictive coding on an image block to produce inter-coded image information for the image block, said inter-coded image information comprising at least one prediction error block containing prediction error information, said decoder comprising

25 decoding means for recovering prediction error information contained in at least one prediction error block, **wherein** the decoder further comprises means for performing a prediction error block check in which prediction error information contained in said at least one prediction error block is examined to detect errors in the inter-coded image

30 information for the image block.

62. A decoder according to claim 61, **wherein** it further comprises means for performing a macroblock check if no errors are detected by said means for performing a prediction error block check, said means

35 for performing a macroblock check comprising means for examining a correspondence between prediction error information relating to a luminance component of the image signal and prediction error information relating to at least one of said at least one chrominance

component of the image signal to detect errors in the inter-coded image information for the image block.

63. A decoder for decoding an image signal, the image signal having
5   been formed by dividing an image into image blocks and performing a coding stage using at least predictive coding on an image block to produce inter-coded image information for the image block, said inter-coded image information comprising a macroblock comprising at least one luminance prediction error block containing prediction error
10 information relating to a luminance component of the image signal and at least one chrominance prediction error block containing prediction error information relating to a chrominance component of the image signal, the image signal comprising at least one chrominance component, and decoding means for recovering prediction error
15 information contained in said at least one luminance prediction error block and said at least one chrominance prediction error block of the macroblock, **wherein** the decoder also comprises means for performing a macroblock check comprising means for examining a correspondence between prediction error information relating to a
20 luminance component of the image signal and prediction error information relating to at least one of said at least one chrominance component of the image signal to detect errors in the inter-coded image information for the image block.

25 64. A storage means for storing a program, said program comprising machine executable code for detecting errors in an image signal, the image signal having been formed by dividing an image into blocks and performing a coding stage using at least predictive coding on an image block to produce inter-coded image information for the image block,
30 said inter-coded image information comprising at least one prediction error block, said program comprising machine executable code for performing a decoding stage to recover prediction error information contained in at least one prediction error block, **wherein** the program further comprises machine executable code for performing a prediction
35 error block check in which prediction error information contained in at least one prediction error block is examined to detect errors in the inter-coded image information for the image block.

65. A storage means according to claim 64, **wherein** said program further comprises machine executable code for performing a macroblock check if no errors are detected by said prediction error block check, said machine executable code for performing a

5   macroblock check comprising machine executable code for examining a correspondence between prediction error information relating to a luminance component of the image signal and prediction error information relating to at least one of said at least one chrominance component of the image signal to detect errors in the inter-coded

10   image information for the image block.

66. A storage means for storing a program, said program comprising machine executable code for detecting errors in an image signal, the image signal having been formed by dividing an image into image

15   blocks and performing a coding stage using at least predictive coding on an image block to produce inter-coded image information for the image block, said inter-coded image information comprising a macroblock comprising at least one luminance prediction error block containing prediction error information relating to a luminance

20   component of the image signal and at least one chrominance prediction error block containing prediction error information relating to a chrominance component of the image signal, the image signal comprising at least one chrominance component, said program comprising machine executable code for performing a decoding stage

25   to recover prediction error information contained in said at least one luminance prediction error block and said at least one chrominance prediction error block of the macroblock, **wherein** said program also comprises machine executable code for performing a macroblock check comprising machine executable code for examining a

30   correspondence between prediction error information relating to a luminance component of the image signal and prediction error information relating to at least one of said at least one chrominance component of the image signal to detect errors in the inter-coded image information for the image block.

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